A Study of the Determinants Affecting Technology Adoption among University Teachers in Uttarakhand

A

SYNOPSIS

(THESIS PROPOSAL)

SUBMITTED TO

THE ICFAI University Dehradun

IN PARTIAL FULFILLMENT OF THE REQUIREMENT

FOR THE AWARD OF THE DEGREE OF

DOCTOR OF PHILOSOPHY (Ph.D.)

IN

EDUCATION

BY

Swati Raturi

(Enrollment No: RSIES220019)

Under the Supervision of

Dr. Meena Bhandari

&

Dr. Puneet Kumar Gupta

ICFAI Education School

The ICFAI University,

Dehradun

September, 2023

The ICFAI University, Dehradun

Candidate's Declaration

I, **Swati Raturi**, declare that the synopsis entitled, ***"A Study of the Determinants Affecting Technology Adoption among University Teachers in Uttarakhand"*** being submitted in the partial fulfillment of the requirement for the award of the degree of Doctor of Philosophy in Education under ICFAI Education School, The ICFAI University, Dehradun during the academic year 2023-24.

It is the work that is expected to carried out under the supervision of Dr. Meena Bhandari, Assistant Professor & Head, ICFAI Education School & Dr. Puneet Kumar Gupta, Assistant Professor, ICFAI Business School. It is further declared that the synopsis is within the plagiarism limit and copy of the same is attached as per the University norms.

Swati Raturi

Signature

Candidate's Name

Date: 17th Oct' 2023

The ICFAI University, Dehradun

CERTIFICATE

This is to certify that the thesis entitled, ***"A Study of the Determinants Affecting Technology Adoption among University Teachers in Uttarakhand"*** is an original piece of work done by ***Swati Raturi*** under our supervision being submitted in the partial fulfillment of the requirement for the award of the degree of Doctor of Philosophy in ***Education*** under ICFAI Education School, The ICFAI University, Dehradun during the academic year 2023-24.

Further, it is certified that the synopsis is within the plagiarism limit and copy of the same is attached as per the University norms.

Signature of the Co-Supervisor in full

17.10.23

Name in Capital Letters

Dr. PUNEET KUMAR GUPTA

Designation & Address

Assistant Professor

ICFAI Business School

The ICFAI University, Dehradun

Signature of the Supervisor in full

17/10/23

Name in Capital Letters

Dr. MEENA BHANDARI

Designation & Address

Dean & Head

ICFAI Education School

The ICFAI University, Dehradun

TABLE OF CONTENTS

List of Tables		***5***
List of Figures		***6***
Abstract		***7***
1	Introduction	8
2	Literature Review	15
3.	Research Gap	28
4.	Research Objectives	28
5.	Conceptual Framework & Hypothesis Development	29
6.	Research Methodology	32
7.	Scope of the Study	34
8.	Expected Contribution of Study	34
	Bibliography	***36***
	Month wise Plan of the Work	***47***

LIST OF TABLES

Table No.	Description	Page No.
2.1	Evolution of Technology Adoption Models	20
2.2	Bibliometric analysis of the extracted literature from the Scopus and WoS databases	26
6.1	Summary of various types of Universities in Uttarakhand	33

LIST OF FIGURES

Figure No.	*Description*	*Page No.*
2.1.	Technology Acceptance Model-1	*16*
2.2.	UTAUT Model	*18*
2.3	UTAUT Model 2	*19*
2.4	UTAUT Model 3	*20*
2.5	Boolean Search Results from Scopus Database	*24*
2.6	Boolean Search Results from WoS Database	*25*
2.7	Flow diagram for the selection of study	*26*
5.1	Proposed Model	*29*

ABSTRACT

In recent years, universities and higher education institutions worldwide have increasingly incorporated Information and Communication Technology (ICT) into their academic and administrative processes. The integration of technology to enhance learning experiences is gaining traction within educational institutions. To optimize the utilization of technology, it becomes imperative for educators to embrace and effectively employ these technological tools in their teaching practices.

This study aims to delve into the motivational factors influencing educators' adoption of technology in higher education. Employing an exploratory-descriptive research approach, the study will target educators in the higher education sector as its sample population.

The integration of technology holds a pivotal role in the realm of higher education, necessitating a comprehensive understanding of the motivational drivers behind the adoption of ICT within classroom instruction and curriculum development. This proposed research endeavors to contribute to the body of knowledge by shedding light on the motivating factors that impact technology adoption among teachers in higher education institutions in Uttarakhand.

1. Introduction

Information and Communication Technology has been transforming the higher education sector in multiple ways. From chalkboards to smart boards, Note Books to e-books, projectors to Virtual Reality/Augmented Reality, brick-and-mortar classrooms to digital virtual learning spaces and textbooks to tablets, the adoption and adaptation of technology is an important driver in digital transformation of education in today's digital world. As the digital technologies redefine the concept of teaching-learning, text book learning in conventional classes has taken a back seat, giving way to digitally enabled education, with a view to improve learning outcomes and augmenting students' learning experience and enabling any-time-any-where education. In this process, a number of new-age Educational Technologies (also known as "EdTech") have come to the fore.

According to Spector (2012), "Educational technology involves the disciplined application of knowledge for the purpose of improving learning instruction and or performance". EdTech refers to the IT-assisted technologies, used for more effective academic delivery, by making classes more convenient, more interesting, more interactive and more inclusive to facilitate personalized learning and enable better educational outcomes. EdTech has started developing at an accelerating pace since 1990s, driven by the Internet and Multimedia technologies, and the growth further accelerated into the 2000s, with smartphones and social networks becoming a part of educational practices. Development of EdTech in 21st century is characterized by co-evolution of pedagogical practices and technologies, such as computer-mediated communication, constructivism, Learning Management System (LMS), WEB 2.0, and Massive Open Online Courses (MOOCs). Last few years have seen innovation in EdTech due to emerging technologies like Artificial Intelligence, Machine Learning, 3D printing, Virtual Reality, Augmented Reality, Gamification, Video Platforms like You Tube, Interactive Whiteboards (like Google Jamboard), Online Collaboration Work Spaces (e.g., Microsoft Teams), Mobile technology, Podcasting, Digital Readers, Tablets etc. Recent additions of Instant Messaging systems like Whatsapp and Extended Reality platforms like Metaverse are making EdTech more interesting, viable, and effective for the learners. As per Ali (2019), Moodle (45%) and YouTube (42%) are the most common learning platforms used by teaching staff.

EdTech positively impacts learning environment, thereby benefiting both students and teachers. Integration of EdTech into classrooms makes students' learning journey more enjoyable,

improves learning outcomes, and enhances their conceptual understanding. It also facilitates social networking and ease of collaboration with other students as well as teachers. Current generation of digital-native students feel more at home, in a digital class room. Ertmer et al. (2011) found significant changes in cultural competency and increased confidence, as learners are interested in technology-based learning, and perceive higher educative value of the digital tools that use Web 2.0 in their classes. Besides, students that have gone through multimedia instruction demonstrated enhanced motivation and creativity (Hayes & Robinson, 2011). In addition, it was found by Hung and Yuen (2010) that the majority of the students that participated in social media enabled classes developed stronger feelings of social connectedness and expressed positive feelings regarding their learning experiences and shared information with other students. In such cases, students' retention of information was also found to be higher. As per Gupta and Dharamveer (2017), the lecturers agreed that Information and Communication Technology (ICT) helped them to improve teaching, with more updated materials.

Learning Management System (LMS) provides the teachers tools to create interesting digital course material. LMS also facilitates an easy way to upload and share educational materials, hold online discussions and chats, give interactive quizzes and online surveys during the class, gather and review assignments, evaluate them and provide continuous feedback to the students so as to guide their learning pathways. EdTech collaboration tools facilitate virtual interaction between teachers and learners as well as among the learners themselves, thereby creating a more conducive and interactive digital eco-system for teaching learning. As per the study by Ali (2019), 95% of the teachers ascertained that integrating with ICT, made the classes more interesting.

Moreover, a number of MOOC are being offered by Government agencies as well as private agencies in a range of disciplines and also in local languages. They can help in supplementing the class room learnings of the students. In rural and urban areas, which face constraints in creating good physical infrastructure and availability of adequate number of teachers, EdTech tools can play a huge role to make quality education accessible to all. Unlike traditional learning methods, EdTech can offer personalized learning options that are far more effective for the modern learner.

National Education Policy 2020 (NEP 2020), launched by Government of India, recognized the advantages of EdTech, while acknowledging its potential risks and dangers. As per NEP-2020, new technologies involving artificial intelligence, machine learning, block chains,

smart boards, handheld computing devices, AI-enabled computerized assessments, and other forms of educational software and hardware can dramatically change not only what students learn in the traditional classroom but also how they learn. The thrust of technological interventions will be for the purposes of improving teaching-learning and assessment processes, supporting teacher in preparation of study material and professional development of the teachers.

Technology Integration is defined as a sustainable and ongoing change in the social system of schools resulting from the adoption of technology in order to help learners to construct knowledge (Belland 2009); the use of ICT tools for teaching (Hew and Brush 2007); the use of ICT tools as integrators to carry out learning and teaching activities (Lim 2007); the use of technology as a tool to support the learning process by teachers and students (Polly et al. 2010)

As technology rapidly becomes indispensable in our day-to-day life, it is becoming increasingly embedded in education and teaching, thereby making technology integration as an important component of transformation of education delivery.

As per World Economic Forum (2022), "While the technology itself will not lead to better quality education, advances in education technology can support more inclusive and skills-based learning and can help enhance educational processes. Furthermore, investment in the adoption of technology in learning can build resiliency into education systems so that they are able to withstand potential future shocks to the system, such as the COVID-19 pandemic". World Economic Forum (2023) highlighted the need for investments in EdTech to support development of skills, which include Abilities and Skills; Attitudes and Values and Knowledge and Information.

The recent COVID-19 pandemic necessitated the readiness of the Educational Institutions, with alternative modes of quality education, whenever and wherever traditional and in-person modes of education are not possible. While a number of Higher Educational Institutions have been deploying Educational Technologies for quite some time, COVID-19 pandemic accelerated its deployment in an unprecedented way. During the course of 2020, due to the unprecedented COVID-19 Pandemic situation, most of the Higher Education Institutions (HEIs) across the world had to switch over to educational technologies to conduct classes for the students, who have to learn remotely from their homes. While it is an undeniable fact that COVID-19 forced the pace of Technology Adoption in Higher Education worldwide, level of response as well as extent of technology adoption varied widely, at institution level as well as at individual level. Some institutions left the modus operandi for conduct of online classes to the discretion of individual

teachers, whereas some institutions deployed the same Educational Technologies for LMS and Video- conferencing platforms across the Institution. In some cases, teachers merely used video conferencing as a platform to teach, whereas some engaged the students better and make the learning more interesting and interactive. However, a number of Institutions in urban / rural areas faced challenges with regard to lack of availability of appropriate digital devices, affordable software, adequate internet bandwidth, thereby depriving them of the leap into digital education.

As per Ali (2019), 92% of the university teachers view online and hybrid modes as imminent pedagogies in tertiary teaching. Though in the last few months, COVID-19 pandemic abated to a large extent in most parts of the world, in some geographies COVID-19 cases have been surfacing again, though not to the same level as in 2021. However, one of the outcomes of COVID-19 pandemic has been that post COVID-19, most of the Higher Educational Institutions continued use of EdTech and shifted to Blended Teaching and Learning (BTL), wherein digital teaching-learning tools are integrated with traditional classroom face-to-face teaching learning. Digital Learning Resources like videos, PPTs, podcasts, recordings and articles are provided to the students before the face-to-face classroom session so that they can go through the study material as per their convenience. This leaves ample time in class for the teachers to engage the students in discussions and co-curricular activities, so that quality of learning is enhanced. This is one of the major aspects of Education 4.0, which is highlighted by National Education Policy (NEP)-2020 of Government of India. NEP 2020 recommends use of blended models of learning and at the same time recognizes the importance of in-person learning for some courses and hence the respective teachers will identify the effective model of blended teaching learning.

As per World Economic Forum (2022) “evidence suggests that technology is deployed most effectively, when used to complement classroom teaching, not substitute for it”. It is undeniable that abstract aspects like concepts can be taught effectively only through in-person teaching-learning, EdTech can easily assist in teaching the easily-defined and concrete aspects like application of concepts and principles. Personalized AI systems can be easily applied to the basic levels of Bloom’s taxonomy, remembering and understanding, to maximize learning outcomes. However, higher levels in the taxonomy – applying, analyzing, evaluating and creating – can be addressed more effectively by specially trained teachers, leveraging EdTech tools. Technology for learning is especially effective for student practice and individualized learning, for example in the form of self-assessment and adaptive periodic recall drills. Learning Management Software can

provide fast and accurate student feedback, which can be tailored to a student's needs, and can free up time for educators to focus on instruction and qualitative feedback.

Teachers are the fulcrum of education delivery and it is reflected in learning outcomes. Quality outcomes depend on the close interface between the teacher and the learner in the learning zone. Traditionally, classroom instruction has largely been teacher-driven, top-down, and one-size-fits-all, but with educational technologies, it now becomes more student-driven, bottom-up, and customized, but teacher continues to play a pivotal role, as a facilitator. While current generation students are tech-savvy, teachers face immense challenges in adopting and adapting EdTech as they belong to different age groups and have different levels of exposure to technology. ***So, the adoption and deployment of EdTech by the teacher is crucial for achieving the learning outcomes.*** EdTech tools provide inputs to the teachers, with a holistic as well as detailed picture of the progress of the individual student's learning journey.

Just like in other sectors, information technology has been helping higher education sector to be more efficient in its operations by using educational technologies (also known as "EdTech"). Educational technologies refer to the IT-assisted technologies that are used for more effective academic delivery (teaching-learning-evaluation) by making the classes more interesting, more engaging /participative, more inclusive, facilitate personalized learning and higher order learning (Bloom's Taxonomy) and enable better educational outcomes. Some examples of innovative educational technologies are Artificial Intelligence, 3d printing, Virtual Reality, Augmented Reality, Gamification, Videos (Like You Tube), Video Games, Interactive whiteboards (like Google Jam board), Online Collaboration Work Spaces (e.g., Microsoft Teams), Learning Management Systems (Moodle, Google Classroom, etc.), use of Mobile technology, Podcasting, Digital Readers, Tablets etc.

Indian EdTech market for 2020-21 was $800 million and is expected to scale up to $30 billion by 2030. Right now, India is home to 4 Unicorns (more than $1 billion market cap). EdTech vendors like Byjus ($16.5 B, Unacademy-$3.4B, Eruditus-$3.2B, UpGrad-$1.2 B), who have been growing online education services. This underlines the need for understanding the factors, influencing Educational Technology adoption by individual teachers, which is critical for the successful digital transformation of higher education. While Educational Institutions have been deploying Educational Technologies for quite some time, COVID-19 pandemic accelerated its use. During the course of 2020, due to the unprecedented COVID-19 Pandemic situation, most of the

Higher Education Institutions (HEIs) across the world had to switch over to educational technologies to conduct classes for the students, who has to learn remotely from their homes. While it is an undeniable fact that COVID-19 accelerated the pace of Technology Adoption in Higher Education World Wide, type of response as well as level of technology adoption varied widely, at institution level as well as at individual level, both teachers and students. Some institutions left the modus operandi for conduct of online classes to the discretion of individual teachers, whereas some institutions deployed the same Educational Technologies for LMS and Video- conferencing platforms across the Institution. In some cases, teachers merely used video conferencing as a platform to teach and engage the students and make the learning more interesting and interactive.

However, a number of teachers, particularly in Government Institutions and those in urban / rural areas faced challenges with regard to lack of availability of appropriate digital devices, affordable software, limited internet bandwidth, cyber security vulnerabilities and privacy issues. Though some institutions have taken important steps towards the integration of education technologies into classrooms, the level of adoption and effectiveness of the same was varied.

Educational technology (EdTech) can play a significant role in implementing the National Education Policy (NEP) in higher education institutions by facilitating several key aspects outlined in the policy. Here are ways in which EdTech can support the implementation of NEP in higher education: Digital Learning Resources: EdTech platforms provide access to a vast array of digital learning resources, including e-books, video lectures, simulations, and interactive multimedia content. These resources align with NEP's goal of promoting high-quality digital materials for teaching and learning are as follows:

- Online Courses and MOOCs: EdTech enables the creation and delivery of online courses and Massive Open Online Courses (MOOCs). This supports NEP's emphasis on credit-based programs, multiple entry and exit points, and flexibility in higher education.
- Blended Learning: EdTech facilitates blended learning models that combine traditional classroom instruction with online components. This approach aligns with NEP's vision of holistic and multidisciplinary education.
- Personalized Learning: Adaptive learning platforms and artificial intelligence can personalize education, allowing students to progress at their own pace. This resonates with NEP's focus on student-centered and adaptive learning.
- Assessment and Evaluation: EdTech platforms offer tools for conducting online

assessments, automated grading, and data analytics. These capabilities support NEP's goal of comprehensive and continuous evaluation.

- Teacher Training and Development: EdTech provides opportunities for teacher professional development through online courses, webinars, and virtual workshops. This addresses NEP's emphasis on continuous teacher training.
- Multilingual Education: Language learning apps and translation tools can help students and faculty in implementing NEP's multilingual education approach.
- Institutional Management: EdTech systems can streamline administrative tasks, such as enrollment, admissions, and fee management, making it easier for institutions to adhere to NEP's guidelines on administrative efficiency.
- Interdisciplinary Research: EdTech facilitates interdisciplinary collaboration among researchers and students, promoting NEP's objective of breaking down silos between disciplines.
- Research and Innovation: EdTech tools enable research, data analysis, and innovation in higher education, supporting NEP's vision of research-driven institutions.
- Open Educational Resources (OER): EdTech platforms can promote the creation and sharing of open educational resources, aligning with NEP's emphasis on reducing the cost of education materials.
- Digital Literacy: EdTech can help improve digital literacy skills among students and faculty, addressing NEP's focus on enhancing technology skills.
- Accessibility and Inclusivity: EdTech can enhance accessibility for students with disabilities through adaptive technologies, aligning with NEP's commitment to inclusive education.
- Global Collaboration: EdTech can facilitate international collaborations and partnerships, which align with NEP's goal of global engagement in higher education.
- Continuous Feedback and Improvement: EdTech platforms can collect data on student performance and engagement, enabling institutions to make data-driven decisions to improve the quality of education, as encouraged by NEP.

In a nutshell in order to fully leverage the benefits of EdTech in implementing NEP in higher education institutions, it is essential for institutions to invest in infrastructure, provide training to faculty and students, ensure the availability of quality digital content, and establish mechanisms for continuous monitoring and evaluation. Additionally, addressing digital divide issues and ensuring equitable access to technology is crucial to make the implementation of NEP inclusive and effective. Acceptance and adoption of technology by the teachers is critical for the success of the adoption by the Institution. While current generation of students are tech savvy and adopt technology in day-to-day life more readily, it is not the case with the teachers. The proposed study will help in in understanding the factors impacting adoption of Educational Technology by teachers in Higher Education Institutions (HEIs).

2. Literature Review

The literature review was conducted in two distinct phases. During the initial phase, a comprehensive examination of theories pertaining to technology adoption was undertaken to gain a comprehensive understanding of the overarching concepts prevalent in the existing literature. In the subsequent phase, a targeted search for articles related specifically to technology adoption within an educational context was conducted, and concise summaries of these articles were provided

2.1 Phase-1 of Literature Review

In this phase, a comprehensive examination of theories pertaining to technology adoption was undertaken to gain a comprehensive understanding of the overarching concepts prevalent in the existing literature. Over the past 45 years, the field of technology adoption has witnessed significant evolution in theories and models that seek to understand how individual users adopt new technologies. The following is a brief overview of this evolution:

2.1.1 Theory of Reasonable Action

Fishbein and Ajzen (1975) propounded the Theory of Reasonable Action (TRA), as per which, “Attitude” is the most important factor that determines Behavioural Intention of a person. “Attitude” is defined as the individual’s evaluation of an object. “Belief” is the link between an object and some attribute, and “Behaviour” is defined as the result or intention. Attitudes are

affective in nature and are based upon a set of beliefs about the object of behaviour. They also depend on the person's subjective norms of the perception of the neighboring community's attitude to a specific behaviour.

2.1.2 Technology Acceptance Model

Technology Acceptance Model (TAM) (Figure 2.1) was introduced by Davis (1986), as an adaptation of the Theory of Reasonable Action. It was specifically adapted for modeling users' acceptance of Information Technologies (IT). The model hinged on two major factors, Perceived Usefulness and Perceived Ease of Use. Perceived Usefulness (PU) is the potential user's subjective perception that the system will benefit the user's actions. Perceived Ease of Use (PEU) is the perception of the user on the efforts needed to use the system.

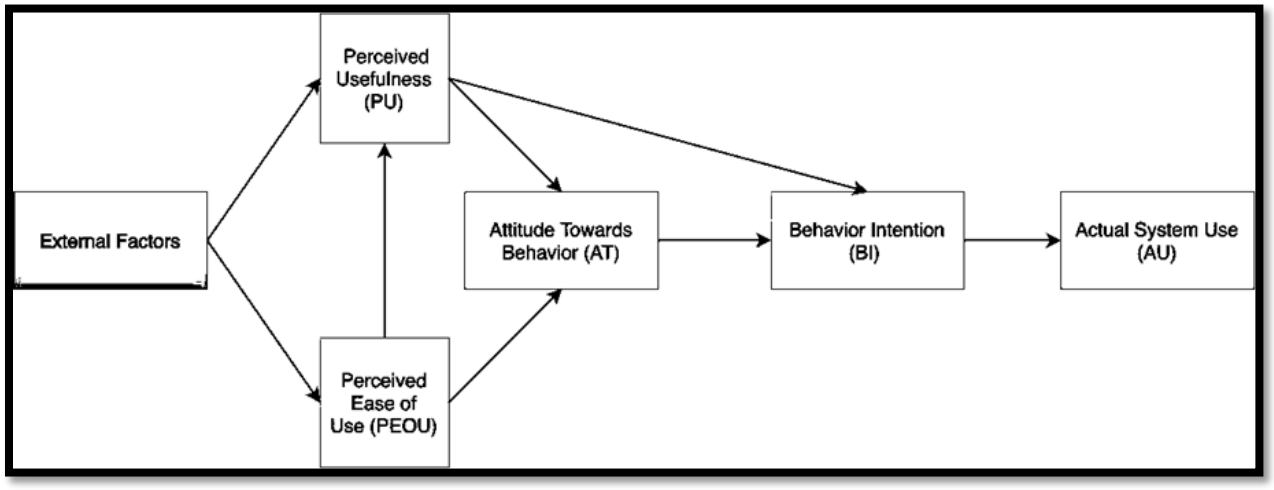

Figure 2.1 – Technology Acceptance Model-1: Source: Davis (1986)

2.1.3 Theory of Planned Behavior

Ajzen (1991) developed the Theory of Planned Behavior, which identified the major factors that determine the behavioural intention. The first two factors are the same as in Theory of Reasonable Action. The third factor is the Perceived Control Behaviour, which is perceived to be the factor limiting the behavior.

2.1.4 Theory of 'diffusion of innovation'

Rogers (1995) proposed the theory of 'diffusion of innovation', which formed the foundation for further research on innovation acceptance and adoption. His research was a synthesis of over 500 diffusion studies on adoption of innovation among individuals and organization. The theory explains the process, through which, an innovation is communicated and deployed over a period of time, among the members of a social system. The theory explains that the innovation and adoption occur after going through multiple stages, which include understanding, persuasion, decision, implementation, and confirmation.

2.1.5 Decomposed Theory of Planned Behaviour

Taylor and Todd (1995) introduced the Decomposed Theory of Planned Behaviour, which consists of three major influencing factors, Attitude, Subjective Norms and Perceived Behaviour Control.

2.1.6 Technology Acceptance Model (TAM-2)

Venkatesh and Davis, (2000), for the first time, tested the enhanced version of Technology Acceptance Model, called TAM-2 (Figure 2.3), using longitudinal data collected on four different systems at four different organizations, two of them involving voluntary usage and balance two studies, involving mandatory usage. The model constructs were measured at three stages, at each organization, which included pre-implementation, one month after implementation, and three months after implementation. TAM-2 model was strongly validated in all the four organizations, at all the three points of measurement. Both social factors (subjective norm, voluntariness, and image) and cognitive and professional factors (job relevance, output quality, result demonstrability, and perceived ease of use) significantly influenced user acceptance of Technology. The results showed that TAM 2 model performed consistently in both the settings, voluntary and mandatory environments. These findings from the longitudinal empirical studies laid a strong foundation for further research on Technology Acceptance Models.

2.1.7 Unified Theory of Acceptance and Use of Technology (UTAUT)

Based on an exhaustive review of the previous dominant technology adoption models, Venkatesh et al. (2003) developed Unified Theory of Acceptance and Use of Technology (UTAUT). It is a synthesis of eight theories / models of technology adoption, which include Theory of Reasoned

Action (TRA), Technology Acceptance Model (TAM), Theory of Planned Behaviour (TPB), Motivational Model (MM), Social Cognitive Theory (SCT), Model of PC Utilisation (MPCU), Innovation Diffusion Theory (IDT) and Combined TAM and TPB, after elimination of similar/redundant constructs. As per the new model (Figure 2.4), four predictors of users' behavioural intention are Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI) and Facilitating Conditions (FC). Antecedents of Performance Expectancy include five constructs, perceived usefulness, extrinsic motivation, job-fit, relative advantage and outcome expectations. Effort Expectancy includes the factors of perceived ease of use and complexity. Gender, Age, Experience and Voluntariness of use were used as Moderating Factors. It was found from the study that PE, EE and SI influenced BI, whereas BI and FC determined Use Behaviour. It was also found that Social Influence was not a significant factor in Voluntary Contexts.

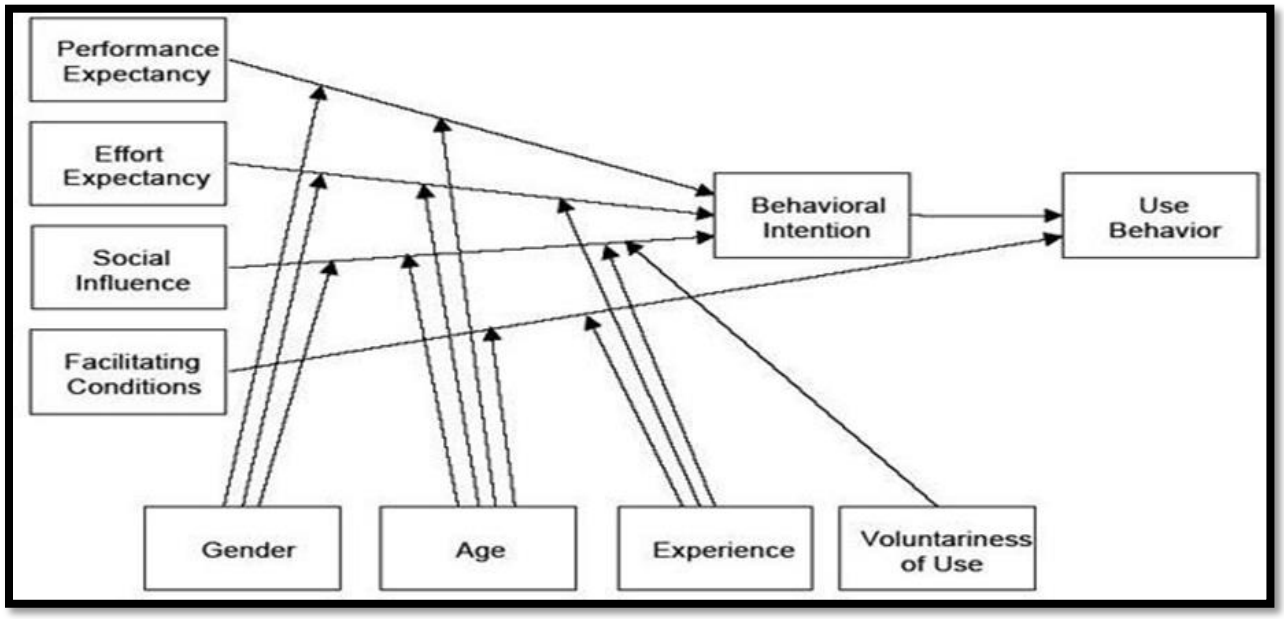

Figure 2.2 - UTAUT Model (Venkatesh et al. 2003)

2.1.8 Technology Acceptance Model (TAM-3)

Combining the TAM 2 Model and the Model of the Determinants of Perceived Ease of Use, Venkatesh and Bala (2008) developed an Integrated Model of Technology Acceptance, named TAM 3, which factored the determinants of Perceived Usefulness (PU) and Perceived Ease of Use (PEU), individual differences, system characteristics, social influence, and facilitating conditions.

In the TAM 3 model (Figure 2.5), the associations of PEU to PU, Computer Anxiety to PEU and PEU to behavioural intention (BI) were moderated by self-experience. This model was tested in real-life situations of IT implementation projects.

2.1.9 Unified Theory of Acceptance and Use of Technology (UTAUT2)

Unlike in the case of UTAUT, wherein the focus was on employees, UTAUT2 focused on consumers. It was found that the four constructs of UTAUT focused on utilitarian value, driven by extrinsic motivational factors. So, three intrinsic motivational factors, Habits, Hedonic Motivation and Price Value, were added to the UTAUT2 model (Figure 2.6) to complement with intrinsic factors. Users' characteristics, age, gender and experiences, were used as moderating variables to influence the relationship between independent variables and Behaviour Intention and use of ICT. UTAUT 2 model saw a significant improvement over UTAUT, in explaining the variance in both Behavioural Intention (56% to 74%) and Use Behavior (40% to 52%) in the empirical study.

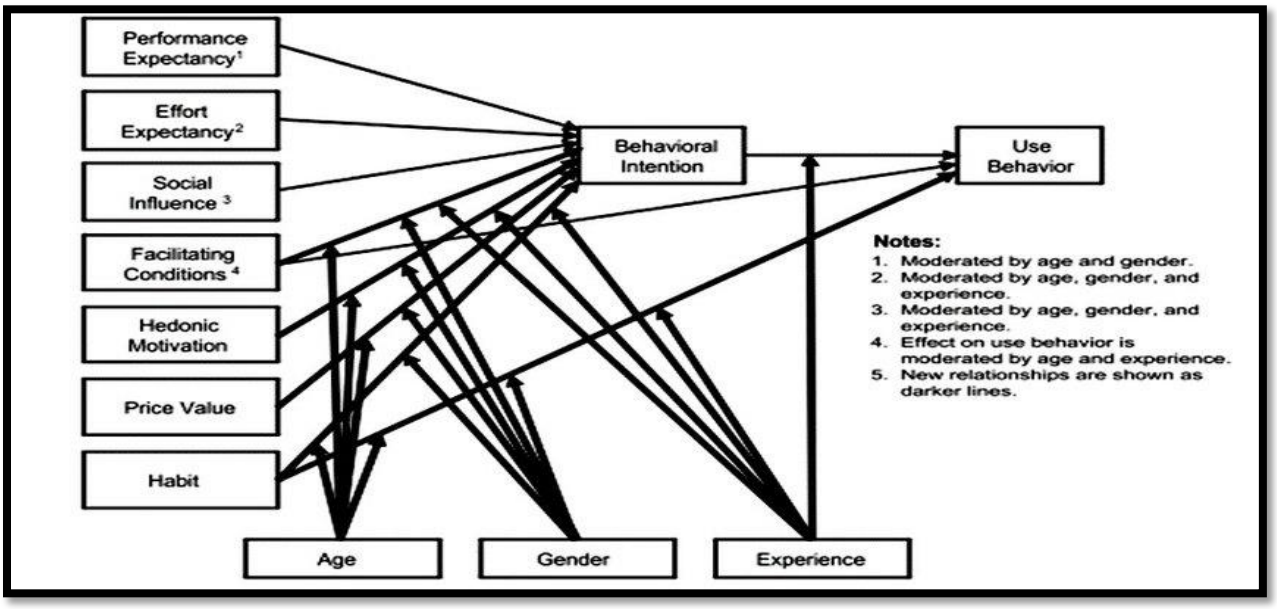

Figure 2.3 – Technology Acceptance Model – UTAUT2 (Source: Venkatesh et al (2012)

2.1.9 Unified Theory of Acceptance and Use of Technology (UTAUT3)

Farooq et al. (2017) have extended the overall body of knowledge by introducing and validating the role of a new construct, i.e. personal innovativeness (PI) in extended unified theory of

acceptance and use of technology (UTAUT2). By doing so, with a rigorous methodology of partial least square (PLS) based structural equation model (SEM), they have not only yielded a considerable potential reap in the context of developing countries; but have also imparted a sizeable theoretical, methodological and contextual contribution. Findings of this study have confirmed that personal innovativeness (PI) in the domain of information technology (IT) is an integral personal trait, which have a significant role in determining users' acceptance and use of technology. Furthermore, the study also validated the existing constructs of extended unified theory of acceptance and use of technology (UTAUT2), and findings of this study confirm that, Performance Expectancy (PE), Effort Expectancy (EE), Facilitating Conditions (FC), Social Influence (SI), Hedonic Motivation (HM), Price Value (PV), Habit (H) and Personal Innovativeness (PI) have a significant role in adoption of latest technological advancements, such as lecture capture system (LCS).

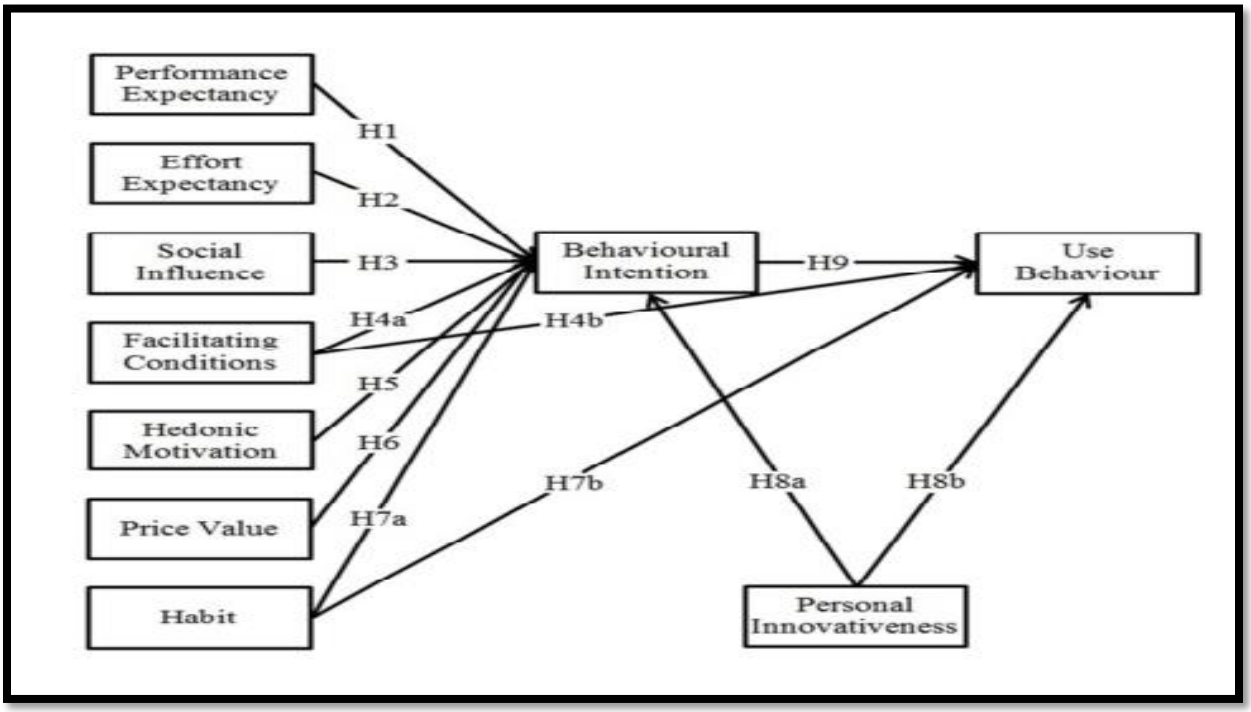

Figure 2.4 – Technology Acceptance Model – UTAUT3 (Source: Farooq et al, 2017)

Table 2.1: Evolution of Technology Adoption Models

S. No	Theory/Model	Author(s)	Year	Constructs/ Salient aspects	Remarks
1	Theory of Reasoned Action (TRA)	Fishbein and Ajzen	1975	Attitude, Subjective Norms	Personal factors
2	Theory of Interpersonal Behaviour (TIB)	Harry Triandis	1977	Personal beliefs, attitudes and social factors	Social Factor added to TRA
3	Expectation-Confirmation Theory (ECT),	Oliver	1980	Customers' purchase intention is determined primarily by their satisfaction with prior use of the product or service	Only one Personal Factor (Prior Usage)
4	Technology Acceptance Model (TAM)	Davis	1986	Perceived Usefulness, Perceived Ease of Use	Only Technology factors. (Extrinsic Factors)
5	Social Cognitive Theory	Bandura,	1986	Personal factors, Environmental factors, and behaviours	Environmental factor added to TIB
6	Theory of Planned Behaviour (TPB)	Ajzen	1991	Attitude, Subjective Norms, Perceived Behavioural Control	Perceived Behaviour control added to TRA
7	Perceived Characteristics of Innovating	Moore and Benbasat's	1991	Relative advantage, compatibility, ease of use, result demonstrability, image, visibility, trial ability, and voluntariness	Technology Factors
8	Model of PC Utilization	Thompson et al.,	1991	Job fit, complexity, long-term consequences, affect toward use, social factor and facilitating conditions	Technology Factors expanded, Facilitative Factors and Social factors added to TAM-1. Scope of Technology limited to PC
9	Motivational Model	Davis et al.,	1992	Intrinsic motivation (computer playfulness and enjoyment) Extrinsic motivation (perceived usefulness, perceived ease of use, and subjective norm)	Intrinsic motivation factors added to TAM-1
10	Igbaria's Model	Igbaria	1994	Perceived fun, perceived usefulness	Perceived Ease of Use replaced with Perceived fun in TAM-1
11	Decomposed theory of Planned Behaviour	Taylor and Todd	1995	Decomposition of Attitudinal Belief Structures (Compatibility+ Perceived Ease of Use+Perceived Usefulness)	Extension of Theory of Planned Behviour by adding the antecedents of the 3 attitude beliefs

				+Decomposition of Subjective Belief Structures (past experience of individual + effects of reference group types) + Decomposition of Control Belief Structures (Self-Efficacy and Facilitating conditions) -> Behavioral Intention	
12	Theory of Diffusion of Innovation	Rogers	1995	Stages of adoption of Innovation, S- shaped Adoption Curve. 5 categories of adopters- Innovators, early adopters, early majority, late majority and laggards.	Phenomenon of diffusion in organizational setting
13	Information System Success Model	Delone and Mclean	1995	6 success factors (Desired System characteristics): system quality, information quality, information use, user satisfaction, individual impacts, and organizational impacts	Only Technology Factors
14	Task Technology Fit	Goodhue and Thompson	1995	Task Characteristics, and Technology Characteristics affect Task Technology Fit, which affects Performance Impacts and Utilisation	Focus on matching technology factors with Task factors. This model is suitable for investigating the actual use of technology
15	Combined model of TPA and TAM	Taylor and Todd	1995	TPB combined with the constructs of Perceived Usefulness and Perceived Ease of Use from TAM	Technology factors coupled with Personal Factors
16	TAM-2	Venkatesh and Davis	2000	Perceived Usefulness, (5 antecedents added: Subjective Norm, Image, Job Relevance, Output Quality, Result demonstrability) Perceived Ease of Use Experience and Voluntariness added as moderators to SN->PU and SN->Intention to use.	TAM-1 extended by adding antecedents to PU. Experience and Voluntariness added as moderators Tested in 4 longitudinal studies
17	Unified Theory of Acceptance and Use of Technology (UTAUT)	Venkatesh, Morris and Davis & Davis	2003	Performance Expectancy, Effort Expectancy, Social Influence, Facilitative Conditions	Synthesized 8 basic models to arrive at the constructs. Theory of Reasoned Action (TRA), Technology Acceptance

					Model (TAM), Motivational Model (MM), Theory of Planned Behavior (TPB), Model of PC Utilization (MPCU), Social Cognitive Theory (SCT), Combined TAM and TPB, and Innovation Diffusion Theory (IDT). Focused on adoption of technology by employees in the organizational context. Focus is only on extrinsic motivators and hence applicability of the model is limited to utilitarian use of technology by users. Could explain 56% of variance in BI and 40% in use.
18	Technological Pedagogical Content Knowledge Framework (TPACK)	Mishra and Koehler	2006	Three types of knowledge – Technology Knowledge (TK), Pedagogical Knowledge (PK) and Content Knowledge (CK)	Specific to Educational Environment and focused only on Knowledge factors of teachers. ts, essential for effective outcomes in education. But the factors are complex and hence very few studies adopted this model.
19	TAM-3	Venkatesh and Bala	2008	Perceived Usefulness, Perceived Ease of Use, Computer Anxiety, Self-Experience	Extension of TAM-2. Cognitive influence replaced with Self Experience. Social influence replaced with Computer Anxiety, which is a personal factor. Tested in IT implementation projects
20	Uses and Gratification Theory	Grellhesl et al.,	2012	Motivations, Behavioural usage and gratifications /satisfaction	Only intrinsic motivational factors
21	UTAUT-2	Venkatesh, Thong and Xu	2012	3 variables added to UTAUT (Habits, Hedonic motivation, Price value). Users' characteristics (age, gender and experience, voluntariness) added as moderating variables.	Gaps identified in UTAUT use in the empirical studies were covered. Intrinsic motivational factors added, enhancing the applicability of the model in different industry, user and use settings.74% of

				variance in BI and 52% in Use of Technology could be explained, which is an improvement over UTAUT.
22	UTAUT-3	Farooq et al. 2017	Personal innovativeness was used as a predictor of behavior intention and use of technology.	58% of variance in BI and 68.2% in Use of Technology could be explained, which is an improvement over UTAUT2.

2.2 Phase-II of Literature Review

In phase II, a review of Systematic Literature Review (SLR) of the articles published in the indexed journals of Web of Sciences (WOS) and Scopus is completed. Also, Shodhganga, the repository of PhD theses, approved by Indian Universities and maintained by Inflibnet was searched for relevant theses and the same were reviewed. Conducting a literature review through esteemed databases such as Scopus and Web of Science holds pivotal importance in academic research. These platforms offer extensive and meticulously curated repositories of scholarly works, guaranteeing the trustworthiness and pertinence of the data retrieved. Researchers can leverage these resources to pinpoint current gaps in knowledge, monitor evolving research directions, and substantiate the importance of their contributions in the wider academic arena. This thorough review procedure not only bolsters the credibility of research but also facilitates the creation of well-informed, contextually anchored research proposals and papers, thus fostering the systematic and evidence-driven advancement of knowledge. Therefore, A boolean search was conducted on 18th July 2023 for published articles on Scopus and Web of Sciences (WoS) database. With the following search string: ((“theor*" OR "Model”) AND (“technolog*”) AND (“Adoption" OR "Acceptance”) AND (“Education*" OR "Learn*")), 417 articles from Scopus and 289 articles from WoS data base were extracted for the literature review (Refer to Figure 2.4 and 2.5). Bibliometric analysis of the extracted literature from the Scopus and WoS databases is presented in the Table 2.2.

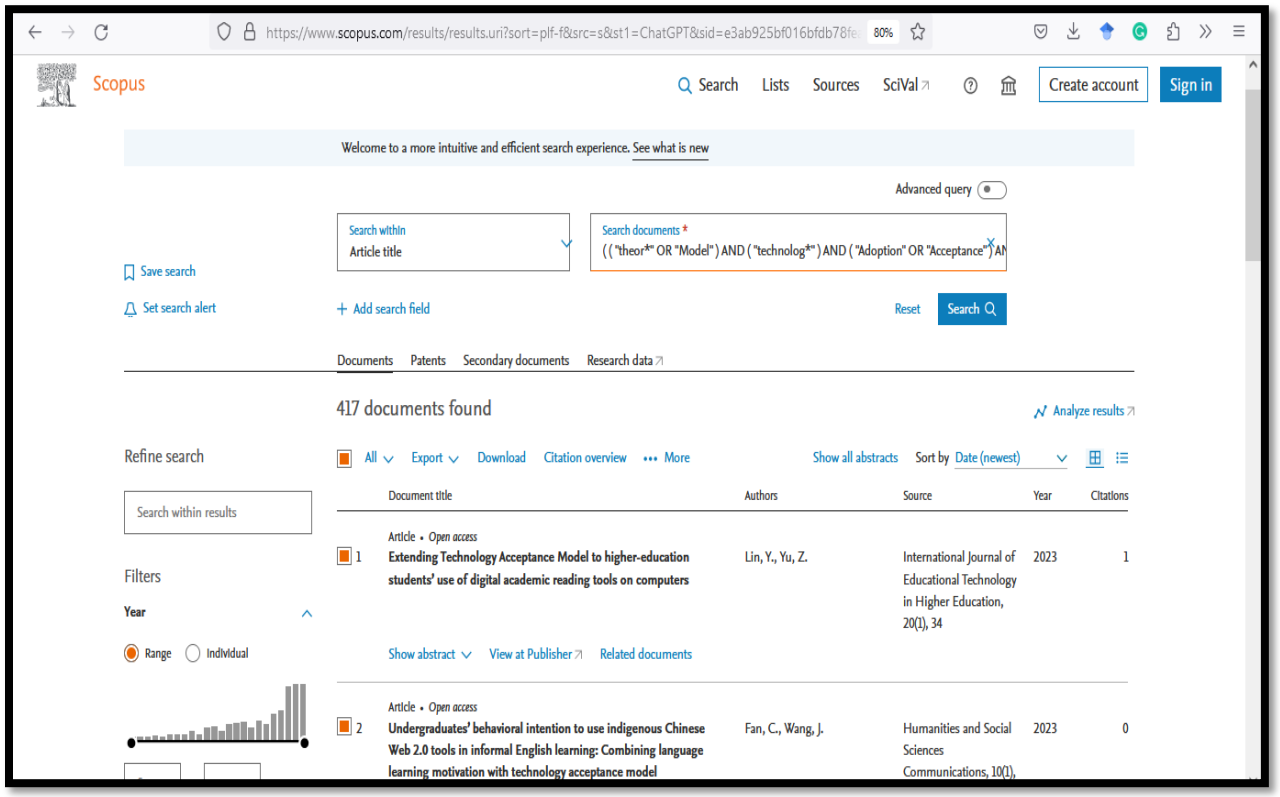

Figure 2.5: Boolean Search Results from Scopus Database

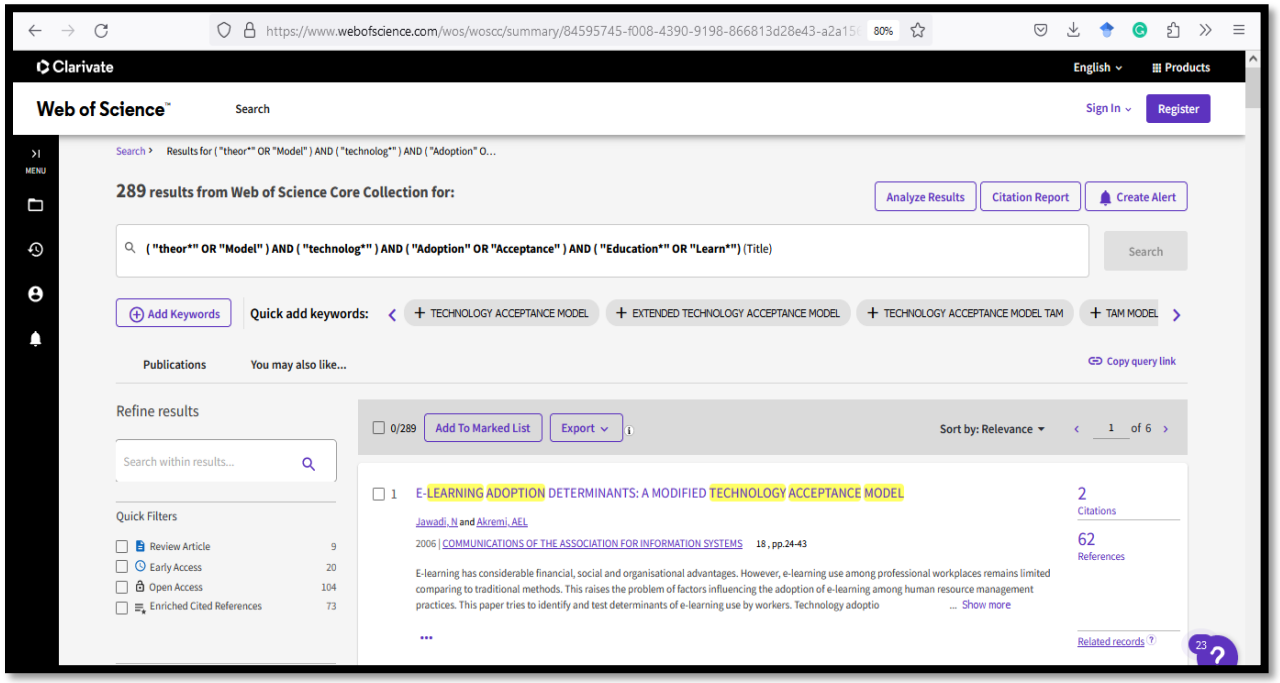
Clarivate
English
Products
Web of Science
Search
Sign In
Register
Search > Results for ("theor*" OR "Model") AND ("technolog*") AND ("Adoption" O...
289 results from Web of Science Core Collection for:
Analyze Results
Citation Report
Create Alert
("theor*" OR "Model") AND ("technolog*") AND ("Adoption" OR "Acceptance") AND ("Education*" OR "Learn*") (Title)
Search
Add Keywords
Quick add keywords:
+ TECHNOLOGY ACCEPTANCE MODEL
+ EXTENDED TECHNOLOGY ACCEPTANCE MODEL
+ TECHNOLOGY ACCEPTANCE MODEL TAM
+ TAM MODEL
Publications
You may also like...
Copy query link
Refine results
0/289
Add To Marked List
Export
Sort by: Relevance
1 of 6
Search within results...
Quick Filters
Review Article 9
Early Access 20
Open Access 104
Enriched Cited References 73
1 E-LEARNING ADOPTION DETERMINANTS: A MODIFIED TECHNOLOGY ACCEPTANCE MODEL
Jawadi, N and Akremi, AEL
2006 | COMMUNICATIONS OF THE ASSOCIATION FOR INFORMATION SYSTEMS 18, pp.24-43
E-learning has considerable financial, social and organisational advantages. However, e-learning use among professional workplaces remains limited comparing to traditional methods. This raises the problem of factors influencing the adoption of e-learning among human resource management practices. This paper tries to identify and test determinants of e-learning use by workers. Technology adoptio ... Show more
2 Citations
62 References
Related records

Figure 2.6: Boolean Search Results from WoS Database

Table

Table 2.2: Bibliometric analysis of the extracted literature from the Scopus and WoS databases

Year	No. of Articles
2002	1
2004	1
2005	2
2006	2
2007	3
2008	9
2009	3
2010	11
2011	8
2012	8
2013	15
2014	18
2015	24
2016	10
2017	30
2018	23
2019	36
2020	39
2021	72
2022	88
2023	77
Grand Total	480

Stakeholder's	No. of Articles
Students	278
Teachers	81
Review	28
Others	93
Grand Total	**480**

Language	No. of Articles
English	466
Spanish	9
Chinese	2
Persian	1
Portuguese	1
French	1
Grand Total	480

Type of Article	No. of Articles
Article	337
Book chapter	9
Conference paper	98
Proceedings Paper	26
Review	10
Grand Total	480

Systematic Literature Review (SLR) of the various articles and thesis extracted from the various database is presented using Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) flow chart in Figure 2.7.

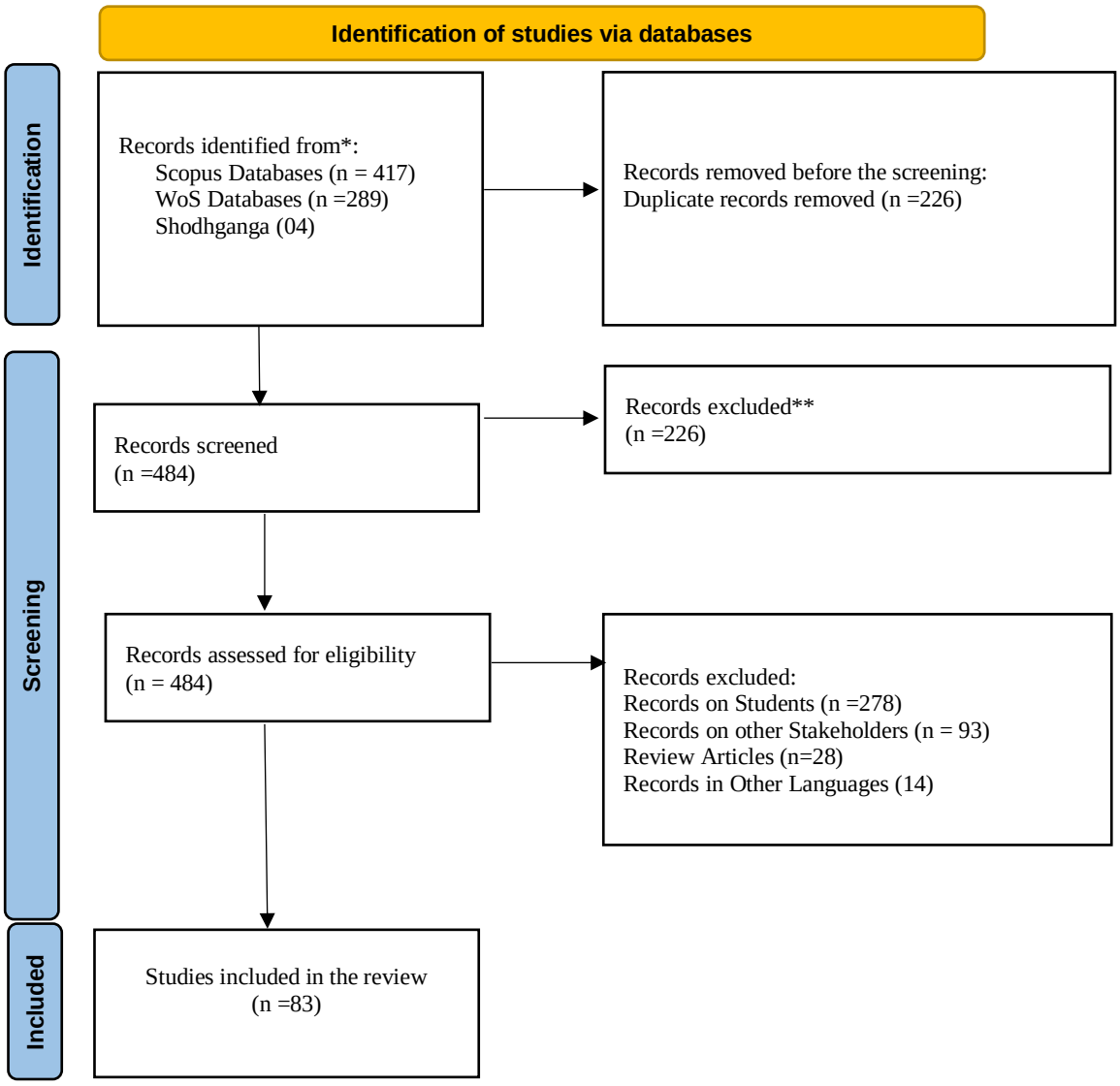

Figure 2.7: Flow diagram for the selection of study

3. Research Gap

On detailed examinations of the literature included in the review process, it is observed that:

- Most of the studies in Asia-Pacific (Singapore, Malaysia, Thailand, Indonesia), Very few (3%) from India and 0% from Uttarakhand
- Most of the studies (61%) covered students as stakeholders, only 18% covered teachers as stakeholders.
- In order to adopt and deploy educational technologies successfully in the institutions, the Type of Institution and location of the institution play an important role which was not included in most of the studies. Being hilly state of India, level of adoption of educational technology may vary from rural to urban area in Uttarakhand.
- UTAUT-2 model was developed in the context of consumers while UTAUT-3 doesn't include any moderator in the model.
- Personal innovativeness may be an important determinant of behavioural intention and hence of use behvaiour, which is not covered in most of the studies.

4. Research Objectives

Based on the gap identified from the literature review, the research work proposed to cover the following objectives:

- *To study the determinants affecting the adoption of educational technologies towards behavioural intention among university teachers.*
- *To determine the impact of behavioural intention on the use behvaiour of educational technologies among university teachers.*
- *To analyze and interpret the effect of moderating variables on the relationship of the determinants affecting the adoption of educational technologies with behavioural intention & use behaviour respectively.*
- *To develop a comprehensive model for determinants of adoption of educational technologies.*

5. Conceptual Framework & Hypothesis Development

On analysis of the various models on technology adoption, it is proposed to use modified version of UTAUT2 and UTAUT3 by adding the personal innovativeness and removing price value as a determinants of adoption of educational technologies among teachers of higher education. Additionally, location, type of institution will be explored as a moderator.

Constructs:

- Dependent variables are Behavioural Intention and Use behaviour.
- Independent variables - Eight Constructs are proposed to be used, which include six from the original UTAUT-2 model (Venkatesh et all, 2012) and one (Personal Innovativeness) from UTAUT3, excluding Price Value, which is not relevant in in educational institutions, unlike in a consumer setting as it is the responsibility of the institution to provide the Educational Technology and neither teachers nor students pay for using the same. Additionally, one more construct, Value Beliefs, is proposed to be added, as it was found to be an important factor for technology adoption by teachers in India, as per the study by Sharma and Srivastava (2019). Exogenous factors will also be dealt with diligence while selecting the main factors, sub-factors and moderating factors.

Definitions of Constructs

- Performance Expectancy (PE): "The degree to which an individual believes that using the system will help him or her to attain gains in performance."
- Effort Expectancy (EE): "The degree of ease associated with the use of the system".
- Social Influence (SI): "The degree to which an individual perceived that important others believe he or she should use the new system"
- Facilitating Condition (FC): "The degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system."
- Habits (HB): "Extent to which people tend to perform behaviours automatically because of learning".
- Hedonic Motivation (HM): "Fun or pleasure derived from using a technology"

- Value Beliefs (VB): “The perception and belief that the task is significant for the achievement of the goals”
- Personal Innovativeness: “The personality trait that reflects the tendency of certain individuals to try out and adopt the latest advancements in IT”

- Moderating variables, proposed:
  - Gender: - Male & Female
  - Age (Up to 30,31-40,41-50,51-60, over 60) - As per the original UTAUT-2 model
  - Experience (Up to 5 years, 5-10 years, 10+ years) As per the original UTAUT-2 model
  - Type of Institution (Government/Private) – New variable
  - Location– (Urban/Rural) - New Variable
- Dependent Variables
  - Behavioural Intention (BI)- “Likelihood of a person to use technology”
  - Use Behaviour (UB)- “Actual Use of technology”

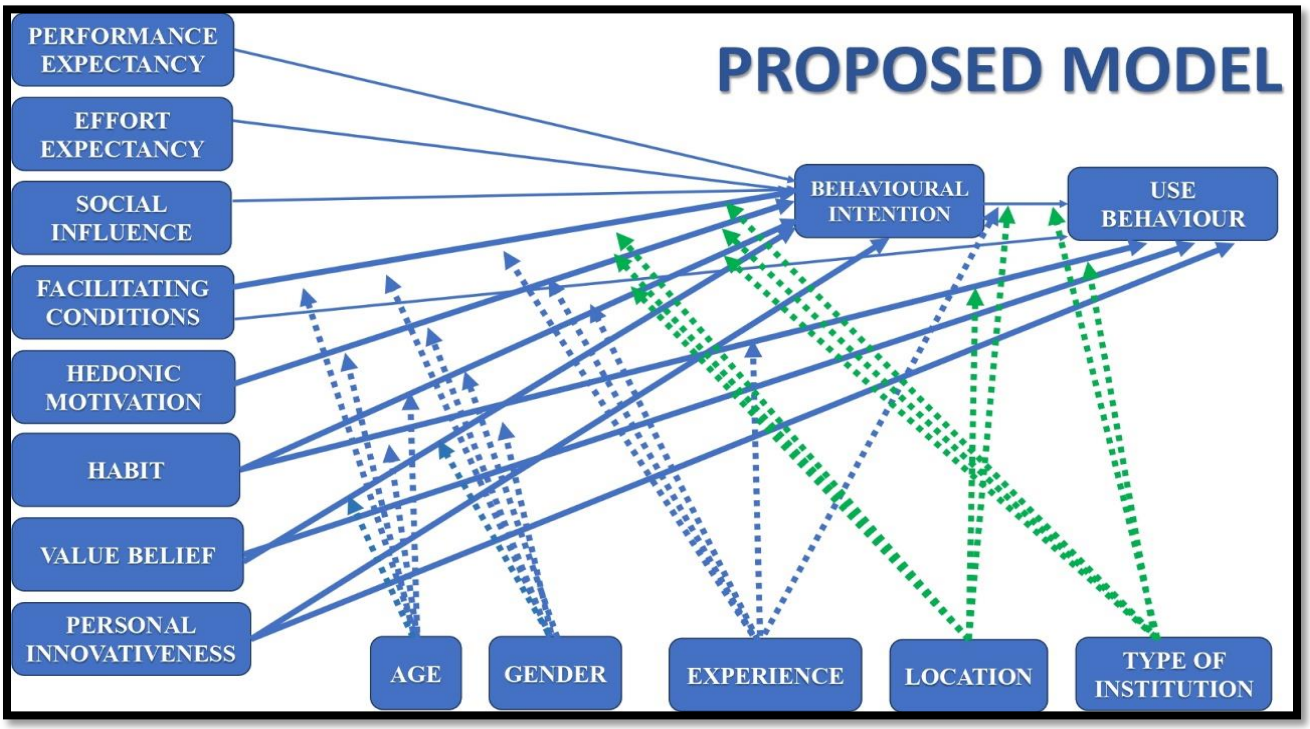

Figure 5.1: Proposed Model

The following section explains the hypothesis testing for direct and indirect effects:

Direct effects

To examine the influence of various factors considered in the research model on behavioural intention on the adoption of educational technologies, following hypotheses are proposed:

H_{1a}: Performance expectancy has a significant influence on behavioural intention to use educational technologies
H_{1b}: Effort expectancy has a significant influence on behavioural intention to use educational technologies
H_{1c}: Social influence has a significant influence on behavioural intention to use educational technologies
H_{1d}: Facilitating conditions has a significant influence on behavioural intention to use educational technologies
H_{1e}: Hedonic motivation has a significant influence on behavioural intention to use educational technologies
H_{1f}: Habit has a significant influence on behavioural intention to use educational technologies
H_{1g}: Value Belief has a significant influence on behavioural intention to use educational technologies
H_{1h}: Personal Innovativeness has a significant influence on behavioural intention to use educational technologies

H_{1i}: Hedonic motivation has a significant influence on use behvaiour towards educational technologies
H_{1j}: Habit has a significant influence on use behvaiour towards educational technologies
H_{1k}: Value Belief has a significant influence on use behvaiour towards educational technologies
H_{1l}: Personal Innovativeness has a significant influence on use behvaiour towards educational technologies

To test the influence of behavioural intention on actual usage of educational technologies, following hypotheses is proposed:

H_{1m}: Behavioural intention has significant influence on use behvaiour towards educational technologies

Moderating effects

To test the moderating effects of Gender, Age, Experience, Type of institution and Location on the significant relationships between the factors influencing adoption of educational technologies and behavioural intention, following hypotheses were framed:

H_{1n}-: Age has significant moderating effect on the relationship between Performance expectancy, Effort expectancy, social influence, facilitating conditions, hedonic motivation, habit, value belief, personal innovativeness and behavioural intention respectively

H_{1o}-: Gender has significant moderating effect on the relationship between Performance expectancy, Effort expectancy, social influence, facilitating conditions, hedonic motivation, habit, value belief, personal innovativeness and behavioural intention respectively
H_{1p}-: Experience has significant moderating effect on the relationship between Performance expectancy, Effort expectancy, social influence, facilitating conditions, hedonic motivation, habit, value belief, personal innovativeness and behavioural intention
H_{1q}-: Location has significant moderating effect on the relationship between Performance expectancy, Effort expectancy, social influence, facilitating conditions, hedonic motivation, habit, value belief, personal innovativeness and behavioural intention
H_{1r}-: Type of institution has significant moderating effect on the relationship between Performance expectancy, Effort expectancy, social influence, facilitating conditions, hedonic motivation, habit, value belief, personal innovativeness and behavioural intention

H_{1s}-: Location has significant moderating effect on the relationship between Performance expectancy, Effort expectancy, social influence, facilitating conditions, hedonic motivation, habit, value belief, personal innovativeness and behavioural intention
H_{1t}-: Type of institution has significant moderating effect on the relationship between Performance expectancy, Effort expectancy, social influence, facilitating conditions, hedonic motivation, habit, value belief, personal innovativeness and behavioural intention

The above hypotheses are main hypothesis written jointly for various determinants. Later on, detailed hypothesis will be written in the thesis work.

6. Research Methodology

Exploratory and descriptive research designs will be used in this study. Literature review and focus group discussion methods of exploratory research design will be employed to identify the pool of items for teacher adoption. Hypotheses will be developed to test relationships among the variables of interest to achieve the objectives of the study. The survey method of descriptive research design will be used to obtain the primary data regarding the employee's perceptions of adopting e-government and job performance. Both primary and secondary data will be used to collect information.

Survey location and Target respondents

The proposed study will be carried out in Uttarakhand state of India. The sampling frame for the study will be the university teachers from Uttarakhand state. As per AISHE Report 2020-21, the details of higher education institutions in Uttarakhand are as follows:

Table 6.1: Summary of various types of Universities in Uttarakhand

Type of University	Count
Central University	1
Institute of National Importance	4
State Public University	11
State Open University	1
State Private University	17
Deemed University-Government	1
Deemed University-Government Aide	1
Deemed University-Private	1
Total	**37**

Source: *AISHE Report 2020-21*

Sample Size and Sampling Technique

The primary step involves obtaining the actual count of teachers from the specified universities listed in Table 6.1 by visiting their respective websites or contacting the universities directly, if necessary. Subsequently, the sample size will be calculated using the guidelines provided by Krejcie and Morgan (1970). To account for potential non-responses, a corrected sample size will be derived.

To collect data from the identified target respondents, an appropriate sampling technique will be employed to ensure the representativeness of the sample and the reliability of the findings.

Data collection

A self-administered standardized questionnaire will be used for primary data collection as a survey instrument. The questionnaire for the survey will be adapted from well-established scales from the literature review. After conducting a pilot study, the questionnaire will be reviewed and fine-tuned before administering the same to the balance target respondents.

Statistical Tools for Analysis

Descriptive statistics will be used to explain the basic characteristics of the data collected. Parametric/Non-Parametric Tests and Structural equation Modeling will be used to analyze structural relationships between measured variables and latent constructs. MS-Excel, R-Studio, SmartPLS etc. will be used to analyze the data.

7. Scope of the study

The proposed research will focus on the integration of educational technologies in academic contexts, comprising teaching, learning, and assessment. These technologies, involving IT-assisted tools, aim to optimize academic delivery by fostering engaging and participative classrooms, ensuring inclusivity, and enabling personalized learning experiences. By leveraging these innovative tools, the study aims to enhance the overall educational process, fostering greater student engagement, improved learning outcomes, and a more dynamic educational environment conducive to the evolving needs of modern learners.

8. Expected contribution of the study

Research oriented significance

This study endeavors to cover the following research gaps that were identified during the Literature Review:

- Level of Technology Adoption, which was not studied in most of the studies.
- Type of the Institution, which influences type of leadership and Organization structure, which play an important role in facilitating and motivating the teachers.
- Blended Learning environment, which is the largest prevailing set-up in most of the Higher Educational Institutions in India. Empirical research conducted so far was mostly in self-learning settings like e-learning, m-learning from students' perspectives and face to face learning from Teachers' perspectives.

- This research will provide a comprehensive model for teachers' adoption of educational technologies among university teachers in Uttarakhand which can be extended to India and other developing countries.

Practical oriented significance

This research will help the Higher Educational Institutions in the following manner:

- To identify the critical factors so that HEIs can plan and implement successful deployment of educational technologies in Higher Education in blended mode by teachers.
- It will help in improving the quality of education, particularly in the context of pandemic, which has a prolonged effect on conduct of face-to-face classes.
- It will help decision-makers in regulators like Ministry of Education to implement NEP-2020, wherein deployment of technology in the pedagogy is an important driver of quality education.
- It will also help the EdTech vendors to design, develop and facilitate Educational Technology Solutions in Higher Educational Institutions so as to improve educational outcomes.

Bibliography

Abdullah, F. and Ward, R. (2016), "Developing a general extended technology acceptance model for E-Learning (GETAMEL) by analysing commonly used external factors", Computers in Human Behavior, Vol. 56, pp. 238-256.

Abu-Shanab, E. and Ababneh, L. (2015), "Exploring academicians' acceptance of E-Learning using an extended TAM: the case of Yarmouk University", Journal of Network Communications and Emerging Technologies (JNCET), Vol. 1 No. 1.

Ain, N. U., Kaur, K., & Waheed, M. (2016). The influence of learning value on learning management system use: An extension of UTAUT2. Information Development, 32(5). https://doi.org/10.1177/0266666915597546

Ajzen, I. (1991). The Theory of Planned Behavior. Organization Behavior and Human Decision Processes, Academic Press, Inc. 179-211.

Ajzen, I. (2002). Perceived behavioral control, self-efficacy, locus of control, and the theory of planned behavior. Journal of Applied Social Psychology, 32(4). https://doi.org/10.1111/j.1559-1816.2002.tb00236.x

Alalwan, A. A., Dwivedi, Y. K., & Rana, N. P. (2017). Factors influencing adoption of mobile banking by Jordanian bank customers: Extending UTAUT2 with trust. International Journal of Information Management, 37(3). https://doi.org/10.1016/j.ijinfomgt.2017.01.002

Avcı, S. (2022). Examining the Factors Affecting Teachers' Use of Digital Learning Resources with UTAUT2. Malaysian Online Journal of Educational Technology, 10(3), 200–214. https://doi.org/10.52380/mojet.2022.10.3.399

Azizi, S. M., Roozbahani, N., & Khatony, A. (2020). Factors affecting the acceptance of blended learning in medical education: application of UTAUT2 model. BMC Medical Education, 20(1). https://doi.org/10.1186/s12909-020-02302-2

Baabdullah, A. M. (2018). Consumer adoption of Mobile Social Network Games (M-SNGs) in Saudi Arabia: The role of social influence, hedonic motivation and trust. Technology in Society, 53. https://doi.org/10.1016/j.techsoc.2018.01.004

Bagozzi, R.P. (2007) The Legacy of the Technology Acceptance Model and a Proposal for a Paradigm Shift. Journal of the Association for Information Systems, 8, 244-254.

Baydas, O., & Yilmaz, R. M. (2017). A model for pre-service teachers' intention to use interactive white boards in their future lessons. Journal of Higher Education and Science, 7(1). https://doi.org/10.5961/jhes.2017.184

Bervell, B. and Umar, I.N. (2017), "Validation of the UTAUT model: re-considering non-linear relationships of exogeneous variables in higher education technology acceptance research. Eurasia

journal of mathematics", Eurasia Journal of Mathematics, Science and Technology Education, Vol. 13 No. 10, pp. 6471-6490.

Chau, P. Y. K., and Hu, P., J. (2002). Examining a model of information technology acceptance by individual professionals: An exploratory study. Journal of Management Information Systems, 18 (4), 191-229.

Chin, W. (1998). The partial least squares approach to structural equation modeling. Modern Methods for Business Research, 295(2), 295–336. https://doi.org/10.1016/j.aap.2008.12.010

Choi, P.M.S. and Lam, S.S. (2018), "A hierarchical model for developing e-textbook to transform teaching and learning", Interactive Technology and Smart Education, Vol. 15 No. 2, pp. 92-103.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS Quarterly, 13(3), 319-340.

Davis, F. D. (1993). User acceptance of information technology: system characteristics, user perceptions and behavioral impacts. International Journal of Man-Machine Studies. 38, (3), 475–487

Davis, F. D., and V. Venkatesh. (1996). A critical assessment of potential measurement biases in the technology acceptance model: Three experiments Internet. J. Human-Comput. Stud. 45 19–45.

Davis, F. D., Bogozzi, R., P., & Warshaw, P., R. (1989). User acceptance of computer technology: A comparison of two theoretical models. Management Science, 35, 982-1003.

Davis, F., Bagozzi, R. and Warshaw, P. (1992), "Extrinsic and intrinsic motivation to use computers in the workplace", Journal of Applied Social Psychology, Vol. 22 No. 14, pp. 1111-1132, doi: 10.1111/ j.1559-1816. 1992.tb00945. x.

Davis, F.D. (1986). A technology acceptance model for empirically testing new end-user information systems: Theory and results. Massachusetts, United States: Sloan School of Management, Massachusetts Institute of Technology.

Dutta, D.K., Gwebu, K.L. and Wang, J. (2015), "Personal innovativeness in technology, related knowledge and experience, and entrepreneurial intentions in emerging technology industries: a process of causation or effectuation?", International Entrepreneurship and Management Journal, Vol. 11 No. 3, pp. 529-555.

Dwivedi, Y.K., Rana, N.P., Jeyaraj, A., Clement, M. and Williams, M.D. (2017), "Re-examining the unified theory of acceptance and use of technology (UTAUT): towards a revised theoretical model", Information Systems Frontiers, Vol. 21, pp. 1-16.

El-Masri, M. and Tarhini, A. (2017), "Factors affecting the adoption of e-learning systems in Qatar and USA: extending the unified theory of acceptance and use of technology 2 (UTAUT2)",

Educational Technology Research and Development, Vol. 65 No. 3, pp. 743-763.

Farooq, M.S., Salam, M., Jaafar, N., Fayolle, A., Ayupp, K., Radovic-Markovic, M. and Sajid, A. (2017), "Acceptance and use of lecture capture system (LCS) in executive business studies: extending UTAUT2", Interactive Technology and Smart Education, Vol. 14 No. 4, pp. 329-348.

Ferreira Barbosa, H., García-Fernández, J., Pedragosa, V., & Cepeda-Carrion, G. (2021). The use of fitness centre apps and its relation to customer satisfaction: a UTAUT2 perspective. International Journal of Sports Marketing and Sponsorship.

Fischer, H., Heise, L., Heinz, M., Moebius, K. and Koehler, T. (2015), "How to identify e-learning trends in academic teaching: methodological approaches and the analysis of scientific discourses", Interactive Technology and Smart Education, Vol. 12 No. 1, pp. 31-43.

Fishbein, M. and Ajzen, I. (1975), Belief, Attitude, Intention and Behavior: An Introduction to Theory and Research, Addison-Wesley Reading, MA.

Fishbein, M., & Ajzen, I. (1975). Belief, attitude, intention, and behavior: An introduction to theory and research. Reading, Mass; Don Mills, Ontario: Addison-Wesley Pub. Co.

Fornell CG and Bookstein FL. (1982) Two Structural Equation Models: LISREL and PLS Applied to Consumer Exit-Voice Theory. Journal of Marketing Research 19(4): 440-452

Fornell, C.G. and Larcker, D.F. (1981), "Evaluating structural equation models with unobservable variables and measurement error", Journal of Marketing Research, Vol. 18 No. 1, pp. 39-50.

Fornell, C. and Larcker, D.F. (1981), "Evaluating structural equation models with unobservable variables and measurement error", Journal of Marketing Research, Vol. 18 No. 1, pp. 39-50.
Gamage, D. and Fernando, S. (2016), "Engaging interactivity in eLearning: review of practices and challenges in Sri Lanka".

Gansser, O. A., & Reich, C. S. (2021). A new acceptance model for artificial intelligence with extensions to UTAUT2: An empirical study in three segments of application. Technology in Society, 65. https://doi.org/10.1016/j.techsoc.2021.101535

Gharrah, A. salameh A., & Aljaafreh, A. (2021). Why Students Use Social Networks for Education: Extension of Utaut2. Journal of Technology and Science Education, 11(1). https://doi.org/10.3926/jotse.1081

Ghasemy, M., Mohajer, L., Cepeda-Carrión, G., & Roldán, J. L. (2020). Job performance as a mediator between affective states and job satisfaction: A multigroup analysis based on gender in an academic environment. Current Psychology, 1-16.

Global Market Insights (2019), "eLearnnig trends", available at: www.globenewswire.com/news-release/2019/03/06/1748554/0/en/E-Learning-Market-to-surpass-300bn-by-2025-Global-Market-Insights-Inc.html

Goodhue, D. L., & Thompson, R. L. (1995). Task technology fit and individual performance. MIS Quarterly, 19, 213-236. JISTEM - Journal of Information Systems and Technology Management Vol. 14, No. 1, Jan/Apr., 2017 pp. 21-38 ISSN online: 1807-1775 DOI: 10.4301/S1807-17752017000100002 JISTEM, Brazil Vol. 14, No. 1, Jan/Apr., 2017 pp. 21-38 www.jistem.fea.usp.br

Gunasinghe, A., Hamid, J. A., Khatibi, A., & Azam, S. M. F. (2020). The adequacy of UTAUT-3 in interpreting academician's adoption to e-Learning in higher education environments. Interactive Technology and Smart Education, 17(1). https://doi.org/10.1108/ITSE-05-2019-0020

Gunasinghe, A., Hamid, J.A., Khatibi, A. and Azam, S. (2018), "Does the lecturer's innovativeness drive VLE adoption in higher education institutes? (a study based on extended UTAUT)", Journal of Information Technology Management, Vol. 10 No. 3, pp. 20-42.

Gunasinghe, A., Hamid, J.A., Khatibi, A. and Azam, S.F. (2019), "does anxiety Impede Vle adoption intentions of state university lecturers? A study based on modified utaut framework", European Journal of Social Sciences Studies, Vol. 1.

Haenlein, M., & Kaplan, A. M. (2004). A beginner's guide to partial least squares analysis. Understanding statistics, 3(4), 283-297.

Hair J.F., Hult, G.T.M., Ringle, C.M. and Sarstedt, M. (2017a), A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM), Sage, Thousand Oaks, CA.

Hair, J. F. Jr., Hult, G. T. M., Ringle, C., & Sarstedt, M. (2014). A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM). Long Range Planning (Vol. 46, Issues 1–2). https://doi.org/10.1016/j.lrp.2013.01.002

Hair, J. F. Jr., Hult, G. T. M., Ringle, C., & Sarstedt, M. (2014). A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM). In Long Range Planning (Vol. 46, Issues 1–2). https://doi.org/10.1016/j.lrp.2013.01.002

Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2017). A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM). Thousand Oaks. Sage, 165.

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. European Business Review, 31(1), 2–24.

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. European Business Review, 31(1), 2–24. https://doi.org/10.1108/EBR-11-2018-0203/FULL/XML

Hair, J.F., Hult, G.T.M., Ringle, C.M., Sarstedt, M., Danks, N.P., Ray, S. (2021). An Introduction to Structural Equation Modeling. In: Partial Least Squares Structural Equation Modeling (PLS-SEM) Using R. Classroom Companion: Business. Springer, Cham. https://doi.org/10.1007/978-3-

030-80519-7_1

Hair, J.F., Jr, Hult, G.T.M., Ringle, C. and Sarstedt, M. (2016), A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM), Sage Publications, New York, NY.

Han, S. (2003). Individual adoption of information systems in organisations: a literature review of technology acceptance model TUCS Technical Report 540; TUCS.

Handoko, B.L. (2019). Technology acceptance model in higher education online business. Journal of Entrepreneurship Education, 22(5).

Hayes, B. G., Taub, G. E., Robinson, E. H., & Sivo, S. A. (2003). An empirical investigation of the efficacy of multimedia instruction in counseling skill development. Counselor Education and Supervision, 42(3), 177-188. https://doi.org/10.1002/j.1556-6978.2003.tb01810.x

Henseler, J., Hubona, G.S. and Ray, P.A. (2017), "Partial least squares path modeling: updated guidelines", in Latan, H. and Noonan, R. (Eds), Partial Least Squares Structural Equation Modeling: Basic Concepts, Methodological Issues and Applications, Springer, Heidelberg, pp. 19-39.

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. Journal of the Academy of Marketing Science, 43(1), 115–135. https://doi.org/10.1007/S11747-014-0403-8/FIGURES/8

History of educational technology. (2015). The SAGE Encyclopedia of Educational Technology. https://doi.org/10.4135/9781483346397.n147
Hrastinski, S. (2008), "Asynchronous and synchronous e-learning", Educause Quarterly, Vol. 31 No. 4, pp. 51-55.

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. Structural Equation Modeling: A Multidisciplinary Journal, 6(1), 1–55.

Huang, C. Y., & Kao, Y. S. (2015). UTAUT2 Based Predictions of Factors Influencing the Technology Acceptance of Phablets by DNP. Mathematical Problems in Engineering, 2015. https://doi.org/10.1155/2015/603747

Hung, H., & Yuen, S. C. (2010). Educational use of social networking technology in higher education. Teaching in Higher Education, 15(6), 703-714. https://doi.org/10.1080/13562517.2010.507307

Jakkaew, P., & Hemrungrote, S. (2017). The use of UTAUT2 model for understanding student perceptions using Google Classroom: A case study of Introduction to Information Technology course.

for Sustainable Growth, ICDAMT 2017. https://doi.org/10.1109/ICDAMT.2017.7904962

Jöreskog,K.G. (1971), "Simultaneous factor analysis in several populations", Psychometrika, Vol. 36 No. 4, pp. 409-426.

Kang, M., Liew, B.Y.T., Lim, H., Jang, J. and Lee, S. (2015), "Investigating the determinants of mobile learning acceptance in Korea using UTAUT2", Emerging Issues in Smart Learning, Springer, New York, NY, pp. 209-216.

Khalid, B., Chaveesuk, S., & Chaiyasoonthorn, W. (2021). Moocs adoption in higher education: A management perspective. Polish Journal of Management Studies, 23(1). https://doi.org/10.17512/pjms.2021.23.1.15

Khasawneh, M. (2015), "Factors influence e-learning utilization in jordanian universities-academic staff perspectives", Procedia - Social and Behavioral Sciences, Vol. 210, pp. 170-180.

Khechine, H. and Lakhal, S. (2018), "Technology as a double-edged sword: from behavior prediction with UTAUT to students' outcomes considering personal characteristics", Journal of Information Technology Education-Research, Vol. 17, pp. 63-102.

Khechine, H., Raymond, B., & Augier, M. (2020). The adoption of a social learning system: Intrinsic value in the UTAUT model. British Journal of Educational Technology, 51(6). https://doi.org/10.1111/bjet.12905

Kock, N. (2015). Common method bias in PLS-SEM: A full collinearity assessment approach. International Journal of e-Collaboration, 11(4), 1-10

Kock, N., & Gaskins, L. (2014). The mediating role of voice and accountability in the relationship between Internet diffusion and government corruption in Latin America and Sub-Saharan Africa. Information Technology for Development, 20(1), 23-43.

Kock, N., & Lynn, G.S. (2012). Lateral collinearity and misleading results in variance-based SEM: An illustration and recommendations. Journal of the Association for Information Systems, 13(7), 546-580

Kuhnel, M., Seiler, L., Honal, A. and Ifenthaler, D. (2018), "Mobile learning analytics in higher education: usability testing and evaluation of an app prototype", Interactive Technology and Smart Education, Vol. 15 No. 4, pp. 332-347.

Lee, Y., Kozar, K. A., & Larsen, K. R. T. (2003). The technology acceptance model; past, present and future. Communication of AIS, 12 (50), 752-780.

Lu, J., Yao, J.E. and Yu, C.S. (2005), "Personal innovativeness, social influences and adoption of wireless internet services via mobile technology", The Journal of Strategic Information Systems, Vol. 14 No. 3, pp. 245-268.

Machimbidza, T. and Mutula, S. (2017), "Factors influencing the behaviour of academics towards peer- reviewed electronic journals in Zimbabwean state universities", South African Journal of

Libraries and Information Science, Vol. 83 No. 2, pp. 42-51.

Mathieson, K. (1991). Predicting user intentions: Comparing the technology acceptance model with the theory of planned behavior. Information Systems Research, 2(3), 173-191.

Meet, R. K., Kala, D., & Al-Adwan, A. S. (2022). Exploring factors affecting the adoption of MOOC in Generation Z using extended UTAUT2 model. Education and Information Technologies, 27(7), 10261–10283. https://doi.org/10.1007/S10639-022-11052-1/TABLES/7

Meyliana, Widjaja, H. A. E., Santoso, S. W., Petrus, S., Jovian, & Jessica. (2019). The Enhancement of Learning Management System in Teaching Learning Process with the UTAUT2 and Trust Model. Proceedings of 2019 International Conference on Information Management and Technology, ICIMTech 2019.

Moore, G.C. and Benbasat, I. (1991), "Development of an instrument to measure the perceptions of adopting an information technology innovation", Information Systems Research, Vol. 2 No. 3, pp. 192-222.

Mubin, O., Novoa, M. and Al Mahmud, A. (2017), "Infusing technology driven design thinking in industrial design education: a case study", Interactive Technology and Smart Education, Vol. 14 No. 3, pp. 216-229.

Murray, K.B. and Häubl, G. (2007), "Explaining cognitive lock-in: the role of skill-based habits of use in consumer choice", Journal of Consumer Research, Vol. 34 No. 1, pp. 77-88.

Nair, P.K., Ali, F. and Leong, L.C. (2015), "Factors affecting acceptance and use of ReWIND: validating the extended unified theory of acceptance and use of technology", Interactive Technology and Smart Education, Vol. 12 No. 3, pp. 183-201.

Nanayakkara, K.S. (2017), "Impact of free and open-source software paradigm for environmental sustainability-case study in higher education sector", International Journal of Research in Electronics and Computer Engineering, Vol. 5 No. 4, pp. 174-188.

Nanayakkara, S. and Kusumsiri, N. (2013), "Barriers to successful implementation of E-Learning in design education".

Nandwani, S. and Khan, S. (2016), "Teachers' intention towards the usage of technology: an investigation using UTAUT model", Journal of Education and Social Sciences, Vol. 4 No. 2, pp. 95-111.

Nicolle, Pamela Stone. (2005), "Technology adoption into teaching and learning by mainstream university faculty: a mixed methodology study revealing the 'how, when, why, and why not'" (2005). LSU Doctoral Dissertations. 2179. https://digitalcommons.lsu.edu/gradschool_dissertations/2179

Oliveira, T., Thomas, M., Baptista, G., & Campos, F. (2016). Mobile payment: Understanding the

determinants of customer adoption and intention to recommend the technology. Computers in Human Behavior, 61. https://doi.org/10.1016/j.chb.2016.03.030

Palagolla, W. and Wickramarachchi, A. (2019), "Effective integration of ICT to facilitate the secondary education in Sri Lanka", arXiv preprint arXiv:1901.00181.

Palos-Sanchez, P., Martin-Velicia, F., & Saura, J. R. (2018). Complexity in the acceptance of sustainable search engines on the internet: An analysis of unobserved heterogeneity with FiMix-PLS. Complexity, 1–19. https://doi.org/10.1155/2018/6561417

Palos-Sanchez, P., Martin-Velicia, F., & Saura, J. R. (2018). Complexity in the acceptance of sustainable search engines on the internet: An analysis of unobserved heterogeneity with FiMix-PLS. Complexity, 1–19. https://doi.org/10.1155/2018/6561417

Palvia, S., Aeron, P., Gupta, P., Mahapatra, D., Parida, R., Rosner, R. and Sindhi, S. (2018), Online Education: Worldwide Status, Challenges, Trends, and Implications, Taylor and Francis, New York, NY.

Purbojo, R. (2018), "Role of the university lecturer in an online learning environment: an analysis of moodle features utilized in a blended learning strategy", Educational Technology to Improve Quality and Access on a Global Scale, Springer, New York, NY, pp. 227-244.

Raman, A. and Don, Y. (2013), "Preservice teachers' acceptance of learning management software: an application of the UTAUT2 model", International Education Studies, Vol. 6 No. 7, pp. 157-164.

Raman, A., & Don, Y. (2013). Preservice teachers' acceptance of learning management software: An application of the UTAUT2 model. International Education Studies, 6(7). https://doi.org/10.5539/ies.v6n7p157

Raman, A., Don, Y., Khalid, R., Hussin, F., Omar, M.S. and Ghani, M. (2014), "Technology acceptance on smart board among teachers in Terengganu using UTAUT model", Asian Social Science, Vol. 10 No. 11, p. 84.

Raman, R., Sairam, B., Veena, G., Vachharajani, H., & Nedungadi, P. (2021). Adoption of online proctored examinations by university students during COVID-19: Innovation diffusion study. Education and Information Technologies, 26(6).

Rao,O R S. (2021). Educational Technology Adoption Models in Higher Education before and during COVID-19: Review and Future Directions for Research. Conference Proceeding of International Conference on Contemporary Issues in Business Management, 1–11.

Rudhumbu, N. (2022). Applying the UTAUT2 to predict the acceptance of blended learning by university students. Asian Association of Open Universities Journal, 17(1), 15–36. https://doi.org/10.1108/AAOUJ-08-2021-0084

Samsudeen, S.N. and Mohamed, R. (2019), "University students' intention to use e-learning systems: a study of higher educational institutions in Sri Lanka", Interactive Technology and Smart Education, Vol. 16 No. 3.

Sharif, A., Afshan, S., & Qureshi, M. A. (2019). Acceptance of learning management system in university students: An integrating framework of modified UTAUT2 and TTF theories. International Journal of Technology Enhanced Learning, 11(2). https://doi.org/10.1504/IJTEL.2019.098810

Sharma, Lavina and Srivastava, Mallika (2019), Teachers' motivation to adopt technology in higher education, Journal of Applied Research in Higher Education, 2050-7003. DOI 10.1108/JARHE-07-2018-0156

Sharma, L., & Srivastava, M. (2020). Teachers' motivation to adopt technology in higher education. Journal of Applied Research in Higher Education, 12(4). https://doi.org/10.1108/JARHE-07-2018-0156

Sharma, S.K., Gaur, A., Saddikuti, V. and Rastogi, A. (2017), "Structural equation model (SEM)-neural network (NN) model for predicting quality determinants of e-learning management systems", Behaviour and Information Technology, Vol. 36 No. 10, pp. 1053-1066.

Shen, C.M. and Shariff, S.A. (2016), "Apply UTAUT model for understanding the teacher perceptions using frog VLE", Paper presented at the Postgraduate Annual Research on Informatics Seminar, Paris.

Shih, Y.Y. & Fang, K. (2004). The use of a Decomposed Theory of Planned Behavior to study Internet banking in Taiwan. Internet Research, 14 (3), 213-223.

Shmueli, G. and Koppius, O.R. (2011), "Predictive analytics in information systems Research", MIS Quarterly, Vol. 35 No. 3, pp. 553-572.

Shmueli, G., Ray, S., Velasquez Estrada, J.M. and Shatla, S.B. (2016), "The elephant in the room: evaluating the predictive performance of PLS models", Journal of Business Research, Vol. 69 No. 10, pp. 4552-4564.

Šumak, B. and Šorgo, A. (2016), "The acceptance and use of interactive whiteboards among teachers: Differences in UTAUT determinants between pre-and post-adopters", Computers in Human Behavior, Vol. 64, pp. 602-620.

Tarhini, A., Masa'deh, R.E., Al-Busaidi, K.A., Mohammed, A.B. and Maqableh, M. (2017), "Factors influencing students' adoption of e-learning: a structural equation modeling approach", Journal of International Education in Business, Vol. 10 No. 2, pp. 164-182.

Taylor, S. and Todd, P. (1995), "Understanding information technology usage: a test of competing models", Information Systems Research, Vol. 6 No. 2, pp. 144-176.

Teo, T., & van Schaik, P. (2012). Understanding the Intention to Use Technology by Preservice Teachers: An Empirical Test of Competing Theoretical Models. International Journal of Human-Computer Interaction, 28(3).

Thompson, R.L., Higgins, C.A. and Howell, J.M. (1991), "Personal computing: toward a conceptual model of utilization", MIS Quarterly, Vol. 15 No. 1, pp. 125-143.

Tseng, T. H., Lin, S., Wang, Y. S., & Liu, H. X. (2022). Investigating teachers' adoption of MOOCs: the perspective of UTAUT2. Interactive Learning Environments, 30(4). https://doi.org/10.1080/10494820.2019.1674888

Ugˇur, N.G. and Turan, A.H. (2018), "E-learning adoption of academicians: a proposal for an extended model", Behaviour and Information Technology, Vol. 37 No. 4, pp. 393-405.

Van Raaij, E.M. and Schepers, J.J.L. (2008), "The acceptance and use of a virtual learning environment in China", Computers and Education, Vol. 50 No. 3, pp. 838-852.

Venkatesh, V. and Bala, H. (2008). Technology Acceptance Model 3 and a Research Agenda on Interventions. Decision Science, 39 (2), 273-312.

Venkatesh, V. and Davis, F. (2000), "A theoretical extension of the technology acceptance model: four longitudinal field studies", Management Science, Vol. 46 No. 2, pp. 186-204, doi: 10.1287/ mnsc.46.2.186.11926.

Venkatesh, V., & Davis, F. D. (1996). A model of the antecedents of perceived ease of use: Development and test. Decision Sciences, 27(3), 451-481.

Venkatesh, V., & Davis, F. D. (2000). A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. Management Science, 46 (2), 186-204.

Venkatesh, V., and Morris, M. G. (2000). Why Don't Men Ever Stop to Ask for Directions? Gender, Social Influence, and Their Role in Technology Acceptance and Usage Behavior. MIS Quarterly (24:1), 115-139.

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. MIS Quarterly: Management Information Systems, 27(3). https://doi.org/10.2307/30036540

Venkatesh, V., Morris, M.G., Davis, F.D., & Davis, G.B. (2003). User Acceptance of Information Technology: Toward a Unified View. MIS Quarterly, 27, 425-478.

Venkatesh, V., Thong, J. Y., & Xu, X. (2012). Consumer acceptance and use of information technology: extending the unified theory of acceptance and use of technology. MIS Quarterly, 157-178.

Venkatesh, V., Thong, J.Y.L. and Xu, X. (2012), "Consumer acceptance and use of information

technology: extending the unified theory of acceptance and use of technology", MIS Quarterly, Vol. 12 No. 1, pp. 157-178.

Venkatesh,V. (2000). Determinants of perceived ease of use: integrating control, intrinsic motivation, and emotion into the technology acceptance model. Information Systems Research, 11(4), 342-365.

Wigfield, A. and Eccles, J.S. (2000), "Expectancy-value theory of achievement motivation", Contemporary Educational Psychology, Vol. 25 No. 1, pp. 68-81.

Yee, M. L. S., & Abdullah, M. S. (2021). A Review of UTAUT and Extended Model as a Conceptual Framework in Education Research. Jurnal Pendidikan Sains Dan Matematik Malaysia, 11, 1-20. https://doi.org/10.37134/jpsmm.vol11.sp.1.2021

Loh, X. M., Lee, V. H., Tan, G. W. H., Ooi, K. B., & Dwivedi, Y. K. (2020). Switching from cash to mobile payment: What's the hold-up? Internet Research, doi.org/10.1108/INTR04-2020-017

Chong, A. Y. L. (2013). Mobile commerce usage activities: The roles of demographic and motivation variables. Technological Forecasting and Social Change, 80(7), 1350-1359

Venkatesh, Viswanath; Thong, James Y. L.; and Xu, Xin (2016). Unified Theory of Acceptance and Use of Technology: A Synthesis and the Road Ahead. Journal of the Association for Information Systems, 17(5), DOI: 10.17705/1jais.00428"

Spector, Michael (2012). Foundations of Educational Technology: Integrative Approaches and Interdisciplinary Perspectives. Routledge, NY, 2012. ISBN: 978-0-415-87471-7

Afridi, Tahira and Hussian Chaudhry (2019), Technology adoption and integration in teaching and learning at public and private universities in Punjab, Bulletin of Education and Research, Aug 2019, Vol 41, No 2, PP121-143

Farooq, M., Salam, M., Jaafar, N., Alain, F., Ayupp, K., Radovic Markovic, M., Sajid, A., 2017. Acceptance and Use of Lecture Capture System (LCS) in Executive Business Studies: Extending UTAUT2. Interactive Technology and Smart Education 14, 329–348. https://doi.org/10.1108/ITSE-062016-0015.

Proposed Month-wise plan of work and targets to be achieved:

S. No.	ACTIVITIES	Months-Year														
		Sept-23*	Oct-23	Nov-23	Dec-23	Jan-24	April-24	--	--	Aug-24	--	Dec-24	--	--	--	July-25
1	Thesis Proposal defense															
2	Extended Literature Review															
3	Questionnaire designing															
4	Pilot testing and refinement															
5	Data collection															
9	Data preparation															
10	Data analysis & Results															
11	Report writing: Chapter1: ……..															
12	Report writing: Chapter 3:															
14	Thesis Writing, Publications and Other															
15	Thesis Submission															

*Month and Year is given just for sample only. Use your proposed month and year in which expected to complete the activity